AMENDMENTS TO THE CLAIMS

The following is a complete listing of revised claims with a status identifier in parenthesis.

LISTING OF CLAIMS

1. (Currently Amended) Method for calibrating a metrology stage in at least two dimensions using an artefact plate having marks forming a pattern, comprising the steps of:

- placing the artefact plate on the metrology stage in at least three arbitrary positions,
- assuming the geometrical properties of the metrology stage and the artefact plate, and the positions of the artefact plate for each measurement,
- forming a model predicting the measurements of the artefact plate,
- measuring the marks by the metrology stage, and
- inverting said model to improve the assumptions on metrology stage and artefact plate.

2. (Original) The method according to claim 1, wherein the inverting is performed in a computer program.

3. (Original) The method according to claim 1, wherein an iterative method is used to calculate successive improvements of the model.

4. (Original) The method according to claim 1, wherein a linear equation system is calculated that approximates the problem to be solved.

5. (Currently Amended) A method for self calibration a metrology stage comprising the steps of:

(a) providing [[a]] an artefact plate having a number of marks scattered thereupon, which is arranged on the metrology stage,

(b) measuring the position of the marks for at least three different measurement views of the plate, which measurement views are obtained using arbitrary translation and/or rotation of the plate, whereby one set of position data for the plate is obtained for each measurement view,

(c) assuming a predetermined shape of the stage, whereby a 2-dimensional stage correction function is determined,

(d) calculate a 2-dimensional plate correction function using the available measured sets of position data for the plate and the stage correction function,

(e) calculate 2-dimensional simulated position data for each mark in all measurement views,

(f) recalculate the 2-dimensional stage correction function from the difference between the simulated position data and the measured position data,

(g) repeat step (d)-(f) until the simulated position data is acceptable compared to the measured position data.

6. (Original) The method according to claim 5, wherein the marks on the plate are arranged in a two-dimensional grid structure.

7. (Original) The method according to claim 5, wherein an average value for all measured position data is used when calculating the plate correction function in step (d).

8. (Original) The method according to claim 5, wherein the predetermined shape of the stage in step (c) is selected be a perfect shape, whereby a 2-dimenstional stage correction function is zero across the stage.

9. (Original) The method according to claim 5, wherein the position data in step (b) is measured in 2 dimensions, whereby the plate is assumed to have a perfectly flat shape.

10. (Original) The method according to claim 5, wherein the position data in step (b) is measured in 3 dimensions, whereby a 2-dimensional set of position data for each measurement view may be calculated using a 2-dimensional z-correction function.

11. (Original) The method according to claim 10, wherein the z-correction function is determined using information regarding the gradient of the plate at each mark and the thickness of the plate.

12. (Original) The method according to claim 5, wherein the repetition in step (g) ends when the deviation of the difference between the simulated position data and the measured position data is below a predetermined value.

13. (Original) The method according to claim 5, wherein the repetition in step (g) ends when a certain number of repetitions of step (d)-(f) has been performed.

14. (New) The method according to claim 1, wherein the marks are arbitrarily scattered across the surface of the artefact plate.

15. (New) The method according to claim 5, wherein the marks on the plate are arbitrarily scattered across the surface of the artefact plate.